

REMARKS

Status

Claims 1-24 were originally filed. In response to a restriction requirement, Applicant canceled claims 3, 4, 6-8, 12, 15-17 and 21-24. The present amendment cancels claims 2 and 9, and adds new dependent claims 25 and 26. Accordingly, it is now claims 1, 5, 10, 11, 13, 14, 18-20, 25 and 26 which are at issue.

The Office Action

In the Office Action mailed March 1, all pending claims were rejected. Claims 13, 14 and 18-20 were rejected under 35 U.S.C. §112, first paragraph. Claims 1, 2, 5 and 9-11 were rejected under 35 U.S.C. §112, second paragraph.

Claims 1, 2, 5, 9-11, 13, 14 and 18-20, all claims then pending, were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,272,238 of Garnier.

Claims 1, 2, 9, 10, 13, 18 and 19 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,312,835 of Wang.

Claims 1, 2, 5, 11, 13, 14 and 20 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. published patent application 2002/0076576 A1 of Li.

Claims 1 and 5 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 6,621,100 of Epstein.

Applicant thanks the Examiner for the Office Action and for the explanation of the basis of the rejections.

The Rejection Under 35 U.S.C. §112, First Paragraph

Claims 13, 14 and 18-20 were rejected under 35 U.S.C. §112, first paragraph, on the asserted grounds that the disclosure is not enabling for the subject matter of those claims. It is

the Examiner's position that it is an essential feature of the present invention that the light-emitting material to which the impurity is added be a material that is singlet emissive material and that it have a singlet-triplet cross section ratio greater than unity. While Applicant does not concede that such is a requisite for the broad aspects of the invention, in the interest of expediting prosecution, Applicant has amended claim 13, and in that regard claims 14 and 18-20 dependent thereupon, to recite that the light-emitting material has an emissive singlet recombination channel and a non-emissive triplet recombination channel and that the singlet recombination cross section is greater than the triplet recombination cross section. In view thereof, this rejection is overcome.

**The Rejection Under 35 U.S.C. §112, Second Paragraph**

Claims 1, 2, 5 and 9-11 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. It is the Examiner's position that while claim 1, and claims 2, 5 and 9-11 dependent thereupon, all include the limitation that the light-emitting material be a singlet-emitting material having a non-emitting triplet channel, and further having a singlet/triplet ratio greater than one, the language of the claim is imprecise, since it is the Examiner's unsupported assertion that phosphorescence based materials cannot be considered singlet-emissive materials. Applicant respectfully submits that this assertion even if true does not support the rejection.

First of all, Applicant is certainly permitted to disclose an invention of a scope broader than the group of claims at issue. Assuming, for the sake of argument, that the Examiner's assertion regarding the nature of phosphorescence based materials is correct, the fact that the claim at issue excludes phosphorescent materials does not render that claim imprecise within the meaning of 35 U.S.C. §112, second paragraph. Claim 1, as it stands, recites a specific genus of light-emissive material; namely, materials which have a singlet emission, no triplet emission, and

a singlet/triplet ratio greater than unity. This recitation will certainly enable one of skill in the art to understand the meaning and scope of the claims and to identify and select specific materials which meet these limitations.

Applicant also notes for the record that the Examiner has presented no evidence supporting her assertion; and in fact, this assertion seems to be at odds with the prior art based rejection based upon U.S. Patent 6,312,835 of Wang. The Examiner has applied the '835 patent against claim 1 which includes the limitation regarding the singlet/triplet characteristics of the material, and the implication from this rejection is that the phosphorescent based materials of the '835 patent do in fact fulfill this criteria. In view of the improppriety and inconsistency of this rejection, Applicant respectfully submits that claims 1, 2, 5 and 9-11 are patentable under 35 U.S.C. §112.

Applicant further notes that claims 9-11 were also rejected as indefinite on the grounds that there is no antecedent basis for "the impurity" as recited in those claims. By the present amendment, this error has been corrected.

#### The Prior Art Based Rejections

##### **1. The Rejection Based Upon U.S. Patent 5,272,238 of Garnier**

Claims 1, 2, 5, 9-11, 13, 14 and 18-20 were rejected under 35 U.S.C. §102(b) as being anticipated by the '238 patent. The '238 patent discloses the manufacture of a ferrocene-containing polymer. As specifically taught in that application, this polymer may be used as a medium in magnetic data storage devices. It is the Examiner's position that the '238 patent discloses a method meeting all of the limitations of the claims at issue. Applicant respectfully disagrees with the Examiner.

The '238 patent discloses a material which does not meet the limitations of the pending claims. Furthermore, the '238 patent in no way suggests the use of its materials in any methods of the present invention. For either of these reasons, the rejection is improper.

In formulating the rejection, the Examiner concedes that the '238 patent does not explicitly disclose the use of the polymer materials disclosed therein as luminescent materials. However, the Examiner asserts that materials in accordance with formulae I and II of the '238 patent will provide known luminescent polymers. With regard to this argument, Applicant points out that the '238 patent does not show or suggest any luminescent polymers. The mere fact that the '238 patent describes certain highly conjugated polymeric materials does not mean that this patent teaches luminescent materials (even though luminescent material may, in some specific instances, comprise highly conjugated organic polymers). In formulating this rejection, the Examiner is asserting that a mere showing of a broad genus of highly conjugated polymers (in the absence of no other teaching) discloses the special claimed invention comprising a species of luminescent polymers.

The '238 patent is entirely directed to the manufacture of ferrocene-containing polymers having utility as magnetic storage devices. There is absolutely no teaching in this patent of any type of luminescent devices or luminescent polymers. It is significant that nowhere does the '238 patent use any of the terms: "triplet," "singlet," "luminescent," "light-emitting" or "light-emitting diode." The mere fact that a polymer is highly conjugated does not make it luminescent, much less a polymer having the recited singlet/triplet criteria of the claims at issue. In no way does the '238 patent show any material which defeats the novelty of any of the claims at issue. Furthermore, there is no teaching or suggestion in the '238 patent, or in any of the other prior art of record, which would direct one of skill in the art to modify the materials of the '238

patent and utilize them in accord with the methods of the pending claims. Accordingly, any possible rejection under 35 U.S.C. §103 is likewise inappropriate.

In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of this rejection.

**2. The Rejection Based Upon U.S. Patent 6,312,835 of Wang**

Claims 1, 2, 9, 10, 13, 18 and 19 were rejected under 35 U.S.C. §102(e) as being anticipated by the '835 patent. The '835 patent discloses electroluminescent devices which include phosphorescent materials comprised of aluminum ions combined with ligands formed by organic chromophores. It is the Examiner's position that aluminum is a paramagnetic material meeting the limitation of the impurities as required by claims 9, 10, 18 and 19; and thus, novelty of these claims, as well as the broad claims reading thereupon, is defeated.

Applicant respectfully submits that this rejection is improper. All claims at issue include the afore-discussed limitations regarding the singlet/triplet characteristics of the materials employed in the practice of the present invention. There is absolutely no teaching in the '835 patent of any light-emitting material having these characteristics. In fact, the words "singlet" and "triplet" are entirely absent from this patent, as are the terms "spin flip" and "spin relaxation." The mere fact that this patent discloses certain light-emitting materials used in a particular group of electroluminescent devices does not in any way mean that this patent discloses the use of the particular class of luminescent materials required by the claims at issue. In fact, Applicant notes, as pointed out above, that this is precisely the point of argument raised by the Examiner in formulating the rejection of claims 13, 14 and 18-20 under 35 U.S.C. §112, first paragraph, as discussed above.

The '835 patent does not show or suggest any materials, methods or devices meeting the limitations of the claims at issue. Therefore, the rejection under 35 U.S.C. §102(e) is improper. Likewise, there is no teaching or suggestion anywhere in the prior art of the possibility or desirability of modifying the teaching of the '835 patent so as to approximate the present invention. Therefore, any possible rejection under 35 U.S.C. §103 is likewise improper.

In view of the foregoing remarks, reconsideration and withdrawal of this rejection is respectfully requested.

**3. The Rejection Based Upon Application US 2002/0076576 of Li**

Claims 1, 2, 5, 11, 13, 14 and 20 were rejected under 35 U.S.C. §102(e) as being anticipated by the Li application. Procedurally, this rejection is improper. The rejection was made under subparagraph (e) of 35 U.S.C. §102, and this section only applies to United States patents or international applications by an applicant who has fulfilled the requirements of paragraphs 1, 2 and 4 of §371(c) of 35 U.S.C. §102. Neither of these situations apply to the case at bar and, procedurally, this rejection is moot insofar as it has no legal basis.

Likewise, any possible rejection under 35 U.S.C. §102(b) is improper since the Li application is effective as a prior art reference as of its publication date and not its filing date.

Even if the Li application was valid prior art, the rejection would be improper. It is the Examiner's asserted position that Li teaches enhancing the luminescence efficiency of luminescent material by including deuterium in the polymer structure, and that based upon this teaching it would be reasonable to expect that the deuterium facilitates low frequency vibrations as recited in claims 11 and 20; and in view thereof, the various claims are lacking in novelty. Applicant notes for the record that the Examiner does not cite to any teaching which supports this proposition, and for this reason alone, the rejection would be improper. While not conceding

the validity of the Examiner's position, Applicant notes that in view of the present amendment, any such rejection is overcome. First of all, there is no teaching in the Li application of the use of any magnetically active impurity in a luminescent material. This limitation appears in claims 1, 2, 5, 9-11, 18, 19, 21 and 22. Furthermore, there is no teaching in the Li patent of any materials or methods for enhancing the spin flip rate of current carriers or increasing the spin lattice relaxation rate of the carriers. All of the claims include one or more of these limitations, and for this additional reason are all patentable over the Li application.

In summary, the rejection based upon the Li application is statutorily improper. Furthermore, even if the rejection could be made statutorily, it fails on substantive grounds in view of the present amendment. Therefore, Applicant respectfully requests reconsideration and withdrawal of this rejection.

**The Rejection Based Upon U.S. Patent 6,621,100 of Epstein**

Claims 1 and 5 were rejected under 35 U.S.C. §102 as being anticipated by the '100 patent. The '100 patent shows the use of a magnetic field to enhance the operation of spintronic devices, which devices can include light-emitting devices. Applicant respectfully submits that in view of the present amendment, this rejection is improper. All claims now include the affirmative limitation that function of the devices of the present invention is improved by the addition of an impurity material into the luminescent material of the device. There is no such teaching in the '100 patent, which is solely limited to use of externally applied magnetic fields to enhance device performance. Therefore, this rejection is overcome. Reconsideration and withdrawal thereof is respectfully requested.

The New Claims

Applicant presents herewith new dependent claims 25 and 26. Both these claims specify that the magnetically active impurity material used to enhance the performance of the devices is a ferromagnetic material. Ferromagnetic materials fall within the broad category of magnetically active materials, and these claims find full support in the specification as originally filed. For example, such support is found in the abstract; on page 5, line 5; page 8, line 20; and page 9, lines 19-22, among others.

Conclusion

In view of the remarks and amendments presented herein, Applicant respectfully submits that all rejections are overcome. Reconsideration and withdrawal thereof is respectfully requested. The application is now in condition for allowance. Should the Examiner have any questions, comments or suggestions which would place the application in still better condition for allowance, she is respectfully requested to call the undersigned attorney collect.

Respectfully submitted,

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